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(71) Applicant (for all designated States except US): **KONINKLIJKE PHILIPS ELECTRONICS N.V.** [NL/NL];
Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **PONOMAREV, Youri**
[NL/BE]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven
(NL).

(74) Agent: **DUIJVESTIJN, Adrianus, J.**; Prof. Holstlaan 6,
NL-5656 AA Eindhoven (NL).

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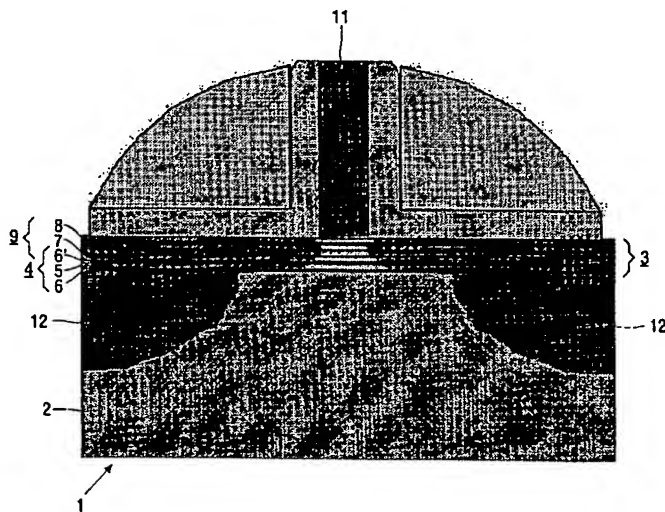
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(54) Title: **SEMICONDUCTOR DEVICE, METHOD OF MANUFACTURING A QUANTUM WELL STRUCTURE AND A SEMICONDUCTOR DEVICE COMPRISING SUCH A QUANTUM WELL STRUCTURE**



(57) Abstract: A semiconductor device (1) and a method are disclosed for obtaining on a substrate (2) a multilayer structure (3) with a quantum well structure (4). The quantum well structure (4) comprises a semiconductor layer (5) sandwiched by insulating layers (6,6'), wherein the material of the insulating layers (6,6') has preferably a high dielectric constant. In a FET the quantum wells (4,9) function as channels, allowing a higher drive current and a lower off current. Short channel effects are reduced. The multi-channel FET is suitable to operate even for sub-35 nm gate lengths. In the method the quantum wells are formed by epitaxial growth of the high dielectric constant material and the semiconductor material alternately on top of each other, preferably with MBE.



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